

WHAT IS CLAIMED IS:

1. A packet-switched communication apparatus which forwards packets pertaining to communication setup between two client terminals, one terminal being attached to a first
5 network and the other terminal being attached to a second network, wherein said first network which carries packets by using a first protocol and said second network which carries packets by using a second protocol are connected via an address translator,

10 said packet-switched communication apparatus comprising:

mapping retaining means for retaining mappings between network-dependent parts of addresses which are used in said first network and address translators;

15 address translator selecting means for selecting one of said address translators, based on an address included in a received packet;

address obtaining means for obtaining a substitutive address to replace the address included in the received
20 packet from the selected address translator; and

address replacement means for replacing the address included in the received packet by using the obtained substitutive address.

2. The packet-switched communication apparatus according to claim 1, wherein said first network and said second network run different protocols of a third layer, and wherein said address to be replaced is included in a
5 section which is a fourth layer or higher of the received packet.

3. The packet-switched communication apparatus according to claim 1 or 2, wherein said mapping retaining means may retain a plurality of address translators mapped
10 to one network-dependent part of an address included in the received packet, and

wherein said address obtaining means selects one of said plurality of address translators associated with an address included in the received packet and sends a request
15 to the selected address translator to obtain said substitutive address.

4. The packet-switched communication apparatus according to claim 3, wherein, after said address obtaining means sends a request for said substitutive address to any
20 address translator selected from said plurality of address translators, if said address obtaining means fails to obtain said substitutive address from the address translator, said address obtaining means selects another address translator out of said plurality of address translators and sends a

request for said substitutive address to said another address translator.

5. The packet-switched communication apparatus according to claim 3 or 4, wherein said address obtaining
5 means repeats the sending of the request for said substitutive address to the selected address translator until predetermined conditions are met.

6. The packet-switched communication apparatus according to claim 5, wherein said address obtaining means
10 repeats the sending of the request for said substitutive address to the selected address translator until obtaining the substitutive address of need.

7. The packet-switched communication apparatus according to claim 5, wherein said address obtaining means
15 repeats the sending of the request for said substitutive address to all the address translators mapped to the network-dependent part of said address.

8. The packet-switched communication apparatus according to claim 5, wherein said address obtaining means
20 repeats the sending of said request by a preset number of times.

9. The packet-switched communication apparatus according to any one of claims 1 through 8,

wherein said first network is an IPv6 network, and

wherein the network-dependent part of said address is a prefix value of an IPv6 address of a client terminal which is connected to said IPv6 network.

10. The packet-switched communication apparatus
5 according to any one of claims 1 through 9;

wherein said address replacement is intended to replace an address specified for a query for a name corresponding to the address of a client terminal for communication in accordance with a DNS protocol,

10 wherein, if said address is an IPv4 address, said address obtaining means obtains an IPv6 address as the substitutive address;

if said address is an IPv6 address, said address obtaining means obtains an IPv4 address as the substitutive
15 address.

11. The packet-switched communication apparatus according to any one of claims 1 through 9, wherein, after said address obtaining means obtains said substitutive address, the address or a string including the address
20 included in the received packet is replaced by said substitutive address or a string including the substitutive address and the packet is forwarded to a predetermined destination.

12. The packet-switched communication apparatus
25 according to any one of claims 1 through 9, wherein, if said

address obtaining means fails to obtain said substitutive address, the received packet is forwarded as is to the predetermined destination.

13. The packet-switched communication apparatus
5 according to claim 1,

wherein said address translator selecting means select one of said address translators, based on a source address of the received packet, and

wherein said address obtaining means sends a request
10 for a substitutive address to the selected address translator.

14. The packet-switched communication apparatus according to claim 10, wherein, upon receiving a name resolution request packet for a name corresponding to an
15 IPv4 address, query data included in the received name resolution request packet is replaced by the obtained substitutive address and a name resolution request packet with the replaced query data is transmitted to a DNS server, when a source IPv6 address of the received name resolution
20 request packet is mapped to an ID of the name resolution request packet to transmit,

wherein said packet-switched communication apparatus further comprises packet ID retaining means for retaining a mapping between said source IPv6 address and said ID of
25 the request packet, and

wherein, upon receiving a reply packet for notification of the name corresponding to the IPv6 address, said address obtaining means selects one of said address translators, based on the IPv6 address mapped to the ID of the reply packet, and sends a request for a substitutive IPv4
5 address to the selected address translator.

15. The packet-switched communication apparatus according to claim 10, wherein, upon receiving a name resolution request packet for a name corresponding to an IPv6 address, said address obtaining means selects one of
10 said address translators, based on the IPv6 address corresponding to a string to be resolved to a name by the request included in the packet, and sends a request for a substitutive IPv4 address to the selected address
15 translator.

16. The packet-switched communication apparatus according to claim 15, wherein, upon receiving a reply packet for notification of the name corresponding to the IPv4 address, said address obtaining means selects one of
20 said address translators, based on the source IPv6 address of the packet, and sends a request for a substitutive IPv6 address to the selected address translator.

17. A communication method for forwarding packets pertaining to communication setup between two client
25 terminals, one terminal being attached to a first network

and the other terminal being attached to a second network,
wherein said first network which uses IPv6 and said second
network which uses IPv4 are connected via an address
translator, said communication method to be applied in a
5 packet-switched communication apparatus which is connected
to said IPv6 network and retains mappings between IPv6
address prefixes and address translators, each being
responsible for a specific range of the prefixes,
comprising:

10 receiving a name resolution request packet on behalf
of a DNS server;

upon receiving said name resolution request packet,
selecting one of said address translators, based on an
address included in the name resolution request packet,
15 referring to said mappings retained on the packet-switched
communication apparatus;

obtaining a substitutive address from the selected
address translator;

by using the obtained substitutive address, replacing
20 a name query string generated from the specified address
included in said name resolution request packet by a name
query string generated from said substitutive address; and
forwarding the name resolution request packet.

18. The communication method according to claim 17,
25 further comprising:

receiving a name resolution request packet for a name corresponding to an IPv4 address;

replacing query data included in the received name resolution request packet by the obtained substitutive
5 address;

transmitting a name resolution request packet with the replaced query data to a DNS server;

mapping a source IPv6 address of the received name resolution request to an ID of the name resolution request
10 packet to transmit;

retaining a mapping between said source IPv6 address and said ID of the request packet;

receiving a reply packet for notification of the name corresponding to the IPv6 address;

15 selecting one of said address translators, based on the IPv6 address mapped to the ID of the reply packet; and

sending a request for a substitutive IPv4 address to the selected address translator.

19. The communication method according to claim 18,
20 further comprising:

receiving a name resolution request packet for a name corresponding to an IPv6 address;

selecting one of said address translators, based on the IPv6 address corresponding to a string to be resolved
25 to a name by the request included in the packet; and

sending a request for a substitutive IPv4 address to the selected address translator.

20. The communication method according to claim 19, further comprising:

5 receiving a reply packet for notification of the name corresponding to the IPv4 address;

 selecting one of said address translators, based on the source IPv6 address of the packet; and

 sending a request for a substitutive IPv6 address to
10 the selected address translator.